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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/501,898	07/20/2004	Hiroshi Ishii	0303-0488PUS1	8548

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EXAMINER	
LIN, ING HOUR	

ART UNIT	PAPER NUMBER
1725	

DATE MAILED: 06/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/501,898	ISHII ET AL.	
	Examiner	Art Unit	
	Ing-Hour Lin	1725	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 July 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *20 July 2004* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *7/04 & 9/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. Figures 10-11 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1-2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Parlee et al in view Kobayashi et al and further in view of Wilcox et al.

Parlee et al (col. 3, lines 23+) teach the claimed fine particle producing apparatus including the use of argon gas supplying tube 36 connected to a metal holder (heated magnesium vaporizer 10), having mounting tube 24 for communicating to the space 26 of an iron pool 14.

Parlee et al fail to teach the use of gas flow rate controller and gas heating controller. However, Kobayashi et al (col. 4, lines 30+) teach the use of induction heating means 18 and inert gas flow rate controller (inert gas flow rate control valve 20) and magnesium-vaporizing tube 6 carrying magnesium 19 in collecting box 11 connected to the open ended 4 of tube 1 for the purpose of effectively producing dispersions of ultafine metal particles. Further, Wilcox et al (col. 3, lines 4+) teach the use of gas heating controller 202 for the purpose of providing an effective induction heating system. It would have been obvious to one having ordinary skill in the art to provide Parlee et al the use of gas flow rate controller and a gas heating controller as taught respectively by Kobayashi et al and Wilcox et al in order to effectively produce dispersions of ultafine magnesium particles.

5. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Parlee et al in view Kobayashi et al and further in view of Wilcox et al and Kunnmann et al.

Parlee et al in view Polanski et al and further in view of Wilcox et al fails to teach the use of cartridge. However, Kunnmann et al (col. 3, lines 34+) teach the use of a cartridge

(magnesium and graphite mixture) for the purpose of carrying a metal sample sealed therein the metal holder. It would have been obvious to one having ordinary skill in the art to provide Parlee et al in view Kobayashi et al and further in view of Wilcox et al the use of a cartridge as taught by Kunnmann et al in order to effectively carry a metal body sealed therein the metal holder.

6. Claims 4-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Porter in view Kobayashi et al and further in view of Wilcox et al.

Porter (col. 2, lines 12+) teaches the claimed fine magnesium nitride particle producing apparatus including the use of argon gas supplying tube 15 connected to a magnesium vapor producing mechanism (heated magnesium furnace 10), having mounting tube 18 for communicating magnesium vapor with high temperature nitrogen gas mechanism provided with a ring 22 in a reacting unit (magnesium nitride reaction chamber 20), wherein the nitrogen gas is supplied through heated gas tube 23.

Porter fails to teach the use of gas flow rate controller and gas heating controller. However, Kobayashi et al (col. 4, lines 30+) teach the use of induction heating means 18 and inert gas flow rate controller (inert gas flow rate control valve 20) and magnesium-vaporizing tube 6 carrying magnesium 19 in collecting box 11 connected to the open ended 4 of tube 1 for the purpose of effectively producing dispersions of ultafine metal particles. Further, Wilcox et al (col. 3, lines 4+) teach the use of gas heating controller 202 for the purpose of providing an effective induction heating system. It would have been obvious to one having ordinary skill in the art to provide Porter the use of gas flow rate controller and a gas heating controller as taught

respectively by Kobayashi et al and Wilcox et al in order to effectively produce dispersions of ultafine magnesium nitride particles.

7. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Porter in view Kobayashi et al and further in view of Wilcox et al and Kunnmann et al.

Porter in view Kobayashi et al and further in view of Wilcox et al fails to teach the use of 90° intersection axes configuration between the magnesium gas and high temperature reaction mechanisms. However, Kunnmann et al (col. 3, lines 66+) teach the use of 90° intersection axes configuration between the mechanism for producing the magnesium gas 40 and high temperature reaction mechanisms 50 for the purpose of effectively producing dispersions of ultafine reaction metal particles. It would have been obvious to one having ordinary skill in the art to provide Porter in view Kobayashi et al and further in view of Wilcox et al the use of 90° intersection axes configuration as taught by Kunnmann et al in order to effectively produce dispersions of ultafine magnesium nitride particles.

8. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Parlee et al in view Kobayashi et al and further in view of Wilcox et al and Khandros et al.

Parlee et al in view Kobayashi et al and further in view of Wilcox et al fails to teach the use of a mold. However, Khandros et al (col. 2, lines 6+) teach the use of a casting mold 16 for the purpose of pouring molten metal from the open top of mold 16 into a mold cavity having a low-oxygen environment provided by a magnesium source (gas source 20) connected to the mold cavity so that a casting with a high quality is produced with low oxide defect. It would

have been obvious to one having ordinary skill in the art to provide Parlee et al in view Kobayashi et al and further in view of Wilcox et al the use of a mold as taught by Khandros et al in order to effectively casting metal without defect.

9. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable Parlee et al in view Kobayashi et al and further in view of Wilcox et al and Khandros et al and Tinnes.

Parlee et al in view Kobayashi et al and further in view of Wilcox et al and Khandros et al fails to teach the use of a molten metal check mechanism. However, Tinnes (col. 2, lines 58+) teaches the use of a molten metal check mechanism (slide 18) for the purpose of preventing or stopping backflow of magnesium. It would have been obvious to one having ordinary skill in the art to provide Parlee et al in view Kobayashi et al and further in view of Wilcox et al and Khandros et al the use of a molten metal check mechanism as taught by Tinnes in order to effectively casting metal without defect.

10. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Porter in view Kobayashi et al and further in view of Wilcox et al and Khandros et al.

Porter in view Kobayashi et al and further in view of Wilcox et al fail to teach the use of a use of a mold. However, Khandros et al (col. 2, lines 6+) teach the use of a casting mold 16 for the purpose of pouring molten metal from the open top of mold 16 into a mold cavity having a low-oxygen environment provided a magnesium nitride source (gas source 20) connected to the mold cavity so that a casting with a high quality is produced with low oxide defect. It would have been obvious to one having ordinary skill in the art to provide Porter in view Kobayashi et

al and further in view of Wilcox et al the use of a mold as taught by Khandros et al in order to effectively casting metal without defect.

11. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Porter in view Kobayashi et al and further in view of Wilcox et al and Khandros et al and Tinnes.

Porter in view Kobayashi et al and further in view of Wilcox et al and Khandros et al fails to teach the use of a molten metal check mechanism. However, Tinnes (col. 2, lines 58+) teaches the use of a molten metal check mechanism (slide 18) for the purpose of preventing or stopping backflow of magnesium. It would have been obvious to one having ordinary skill in the art to provide Porter in view Kobayashi et al and further in view of Wilcox et al and Khandros et al the use of a molten metal check mechanism as taught by Tinnes in order to effectively casting metal without defect.

12. Claims 12-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Parlee et al in view Kobayashi et al and further in view of Wilcox et al and Ban et al.

Parlee et al in view Kobayashi et al and further in view of Wilcox et al fail to teach the use of a use of a mold having a reactive gas supply mechanism. However, Ban et al (col. 4, lines 31+) teach the use of a casting mold 12 having a reactive nitrogen gas supply mechanism 12d (col. 7, line 20+) for the purpose of pouring molten metal from the open top of mold 16 into a mold cavity having an reaction environment of magnesium nitride provided from separate magnesium source introduced to the mold cavity 12b and reactive nitrogen gas supply mechanism 12d so that a casting with a high quality is produced with low oxide defect. It would

have been obvious to one having ordinary skill in the art to provide Parlee et al in view Kobayashi et al and further in view of Wilcox et al the use of a mold as taught by Ban et al in order to effectively casting metal without defect.

13. Claims 14-18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Khandros et al in view of either Porter or Parlee et al.

Khandros et al (col. 2, lines 6+) substantially teach the claimed method of pouring molten metal from the open top of mold 16 into a mold cavity having a low-oxygen environment provided by a gas source 20 connected to the mold cavity. Khandros et al fail to teach the use of a directly connectable reaction unit in claims 14-15 and an active magnesium fine particle producing mechanism and a casting method in claims 16-18. However, Porter (col. 3, lines 61+) teaches a directly connectable reaction unit for the purpose of providing a magnesium nitride vapor collected from the exit source or tube 28, comprising: fine magnesium nitride particle producing apparatus including the use of argon gas supplying tube 15 connected to a magnesium vapor producing mechanism (heated magnesium furnace 10), having mounting tube 18 for communicating magnesium vapor with high temperature nitrogen gas mechanism provided with a ring 22 in a reacting unit (magnesium nitride reaction chamber 20), wherein the nitrogen gas is supplied through heated gas tube 23. Further, Parlee et al (col. 3, lines 61+) teach the use of a heated magnesium vaporizer 10 for the purpose of generating a magnesium vapor space 26. It would have been obvious to one having ordinary skill in the art to provide Khandros et al, respectively, the use of a directly connectable reaction unit and a heated magnesium vapor source as taught by Porter and Parlee et al in order to substitute the gas source

20 and effectively couple or connect the mold cavity and provide a casting cavity environment filled with magnesium nitride or coated with magnesium vapor or particles; and produce a casting having high quality with a low-oxygen defect.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ing-Hour Lin whose telephone number is (571) 272-1180. The examiner can normally be reached on M-F (8:00-5:30) Second Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Dunn can be reached on (571) 272-1171. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

I.-H. Lin

5-18-05

M. A. ELVE

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